



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,052	10/28/2003	Philippe Caze	SP02-227	5896
22928	7590	04/14/2011		
CORNING INCORPORATED			EXAMINER	
SP-TI-3-1			LEUNG, JENNIFER A	
CORNING, NY 14831				
			ART UNIT	PAPER NUMBER
			1774	
			NOTIFICATION DATE	DELIVERY MODE
			04/14/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usdoCKET@corning.com

Office Action Summary

Application No.

10/696,052

Applicant(s)

CAZE ET AL.

Examiner

JENNIFER A. LEUNG

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,6-9,14-18 and 26-29 is/are pending in the application.
- 4a) Of the above claim(s) 3,4,10-13 and 19-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,6-9,14-18 and 26-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 16, 2010 has been entered.

Status of the Claims

2. Claim 5 is canceled. Claims 3, 4, 10-13 and 19-25 are withdrawn. Claims 1, 2, 6-9, 14-18 and 26-29 are under consideration.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 2, 6-9, 14-18 and 26-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1 (at line 9) and claim 26 (at line 9), the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 2, 6-9, 14-18 and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghosh et al. (US 5,993,750) in view of Burdon et al. (WO 00/21659) and Stiles et al. (US 3,518,206).

Regarding claims 1, 2, 26 and 27, Ghosh et al. discloses a microstructure suitable for chemical processing and manufacturing, said microstructure comprising:

a plurality of microchannel walls defining at least one microchannel for accommodating chemicals to be processed (i.e., in layer **40**, with fluid channels and reaction chambers **44**, **46**, **48**, see FIGS. 1, 4a; see column 5, lines 13-46; see also column 3, lines 57-64 regarding microchannel dimensions); said plurality of microchannel walls being supported between two or more planar substrates comprised of ceramic (i.e., layer **40** is sandwiched between planar layers **30** and **100** of ceramic material; see FIG. 1); wherein at least one of the plurality of microchannel walls may further comprises a porous membrane (i.e., one or more than one filters **62**, see FIG. 5c; column 6, lines 12-24).

Ghosh et al. discloses that the plurality of microchannel walls in layer **40** comprise a

consolidated fired frit of a ceramic material (i.e., the microchannel walls are formed by sintering a green compacted perform of particulate ceramic powder; see column 3, line 65 to column 4, line 9). Ghosh et al., however, fails to disclose whether the plurality of microchannel walls may alternatively comprise a consolidated fired frit of glass.

Burdon et al. teaches an apparatus comprising a plurality of microchannel walls defining at least one microchannel (see page 18, lines 16-20). The apparatus may be configured for chemical processing, by providing at least one coating layer comprising a catalyst on the microchannel wall (see FIG. 14; page 36, line 26 to page 38, line 16). In particular, Burdon et al. teaches microchannel walls comprising a consolidated fired frit of glass (i.e., green-sheets composed of particles of glass, dispersed in a polymer binder, and optionally with additives, are textured using various techniques to form desired structures, such as vias, channels or cavities. The green-sheets are then laminated and sintered together to form a substantially monolithic structure, defining the consolidated fired frit of glass; see page 16, line 17 to page 17, line 10; page 18, line 3 to page 19, line 9; page 22, line 9 to page 26, line 11). Glass particles may be selected as an alternative to ceramic particles for forming the frit (see page 16, lines 19-20).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute a consolidated fired frit of glass for the consolidated fired frit of ceramic for forming the plurality of microchannel walls in the apparatus of Ghosh et al., on the basis of suitability for the intended use thereof, because the glass material would have been an art recognized equivalent to the ceramic material for the structuring of microchannel walls in a microstructure intended for chemical processing, as taught by Burdon et al.

Ghosh et al. further discloses that the microstructure may be used for facilitating catalytic

reactions, since “[c]atalytic reactions can be enhanced by providing a large surface to volume ratio by introducing reactants to catalytic surfaces.” (see column 2, lines 30-35). Ghosh et al., however, does not specifically disclose that the catalytic surfaces comprise a coating layer including a catalyst support and a catalyst adhered to the walls, said catalyst being uniformly distributed throughout the coating layer.

Stiles et al. teaches a conventional method for producing catalytic surfaces on a support structure made of materials such as glass or fused silica (see column 1, line 70 to column 2, line 15), wherein the catalytic surfaces comprise a coating layer including a catalyst support (e.g., formed from silica sol, alone or in combination with sols of one or more metal oxides; see column 7, lines 44-60) and a catalytic material (see column 5, lines 3-16), wherein the catalyst is uniformly distributed throughout the coating layer (i.e., the catalytic material is mixed with the silica sol and subsequently applied to the surfaces of the support structure, thereby inherently producing a uniform distribution of the catalytic material in the coating layer; see column 6, lines 39-68; Items 5 and 7 in Example 1)

It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a coating layer including a catalyst support and a catalyst, wherein the catalyst is uniformly distributed throughout the coating layer, for the catalytic surfaces in the apparatus of Ghosh et al., because the use of such technique for producing catalytic surfaces on similar support materials would have been conventionally known in the art of catalysis, and such coating would be adherent, durable, and highly active with a high specific surface, as taught by Stiles et al. (see column 1, lines 55-62). Furthermore, the examiner takes official notice that the provision of the coating on all of the interior surfaces of the at least one microchannel, for

predictably enhancing catalytic activity by increasing the available surface area for interaction between the chemicals to be processed and the catalyst of the coating layer, would have been well known to those of ordinary skill in the art.

Regarding claim 6, the modified apparatus of Ghosh et al. structurally meets the limitations set forth in this product-by-process claim because the claimed product is the same as, or obvious from, the product of the prior art. The determination of patentability is based on the product itself, and not its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir.1985).

Regarding claim 7, Stiles et al. further teaches that the coating may comprise a plurality of coating layers (see Example 1, under Items 5-8; a honeycomb is first coated with the catalytic composition under Item 5 and subsequently coated with the catalytic composition under Item 7). It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a plurality of coating layers in the modified apparatus of Ghosh et al., on the basis of suitability for the intended use thereof, because the provision of multiple coating layers to create a desired combination of catalytic effects would have been conventionally known in the art, as evidenced by Stiles et al.

Regarding claims 8 and 9, Stiles et al. further teaches that the catalyst support comprises a sol binder, wherein the sol binder may include an alumina sol binder (see column 7, lines 43-59; Example 19). It would have been obvious for one of ordinary skill in the art at the time the invention was made to include an alumina sol binder in the coating layer in the modified

apparatus of Ghosh et al., on the basis of suitability for the intended use thereof, because the addition of the alumina sol binder would have rendered the supported catalyst to be suitable for operation at high temperatures, as taught by Stiles et al.

Regarding claims 14 and 15, Stiles et al. further teaches that known catalytic materials include oxides of metals such as nickel, as well as platinum in elemental form (see column 5, lines 3-16). It would have been obvious for one of ordinary skill in the art at the time the invention was made to select a claimed catalytic material for the catalyst in the modified apparatus of Ghosh et al., on the basis of suitability for the intended use of catalyzing a desired chemical reaction, because the claimed catalytic materials would have been recognized as conventional catalytic materials in the art, as evidenced by Stiles et al.

Regarding claims 16-18, 28 and 29, because the modified microstructure of Ghosh et al. includes all of the claimed structural components, the microstructure would, inherently, be capable of operating under an internal pressure within the instantly recited ranges, absent a showing otherwise.

Response to Arguments

5. Applicant's arguments with respect to claims 1, 2, 6-9, 14-18 and 26-29 have been considered but are moot in view of the new grounds of rejection, necessitated by amendment. Specifically, Ghosh et al. discloses a microstructure which comprises the newly added feature of a plurality of microchannel walls being supported between two or more planar substrates.

Applicant (at page 7, last paragraph) notes that,

“The presence of substrates separate from the frit-comprised walls or sintered frit walls, as recited in the presently amended claims, allows for better creation and preservation of desired shapes and structures.”

However, it is noted that the features upon which Applicant relies (i.e., two or more planar substrates which do not comprise a frit material) are not recited in the rejected claim. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER A. LEUNG whose telephone number is (571) 272-1449. The examiner can normally be reached on 9:30 am - 5:30 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter D. Griffin can be reached on (571) 272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jennifer A. Leung/
Primary Examiner, Art Unit 1774